U.S. Environmental Protection Agency
Office of Research and Development

BOARD OF SCIENTIFIC COUNSELORS
MERCURY MULTI-YEAR PLAN SUBCOMMITTEE

Conference Call Summary
January 19, 2005
9:00 a.m.–12:00 noon EST

Welcome, Introduction, and Administrative Procedures

Ms. Heather Drumm, Designated Federal Officer (DFO) for the Mercury Multi-Year Plan (MYP) Subcommittee, opened the conference call by welcoming Dr. Herb Windom, Chair of the subcommittee, and the subcommittee members. This was the first of three scheduled meetings; the second is a face-to-face meeting planned for February 23-24, 2005, and the third is a conference call on March 29, 2005.

Ms. Drumm presented background information on the Board of Scientific Counselors (BOSC), a federal advisory committee that provides independent scientific peer review and advice to the Environmental Protection Agency's (EPA's) Office of Research and Development (ORD). The BOSC Executive Committee established the Mercury Subcommittee to review the Mercury MYP. There are seven members on the subcommittee; more information about the members is available on the Web at www.epa.gov/osp/bosc. The subcommittee members were asked to respond to charge questions and provide a report for the Executive Committee. The Executive Committee will review, revise, and approve the report, which will be submitted to the Assistant Administrator for Research and Development. The role of the BOSC is to provide advice and recommendations to ORD; however, the rights of decision-making and program implementation remain with the Agency.

As DFO for the subcommittee, Ms. Drumm serves as the liaison between the subcommittee and the Agency. She is responsible for ensuring the subcommittee's compliance with the requirements of the Federal Advisory Committee Act (FACA). FACA rules include the following:

- ✧ All subcommittee meetings on substantive issues, whether by phone, e-mail, or in person, are open to the public, including any group communications that involve at least one-half of the subcommittee. Issues that are solely administrative or preparatory are exempt from this requirement.

- ✧ A Federal Register notice must announce all meetings 15 calendar days in advance. Notice for this meeting was published on December 30, 2004.

- ✧ The DFO must approve the agenda and attend all meetings.

- ✧ The Chair of the subcommittee must certify the meeting minutes within 90 days of the meeting.

- ✧ All advisory committee documents must be made available to the public.

- ✧ The subcommittee provides advice to the BOSC Executive Committee; it does not report directly to ORD.

The DFO also ensures that all appropriate ethics regulations are satisfied. Each of the subcommittee members has filed a standard government financial disclosure report and has taken the required annual ethics training.

Ms. Drumm stated that several members of the public asked to participate in this conference call; however, no one requested time to make an oral presentation. She added that time would be allotted for public comments, limited to 3 minutes each, at the end of the conference call. She also asked members to identify themselves when making comments, so that their comments can be attributed in the official record. She then turned the meeting over to Dr. Windom.

Dr. Windom expressed his appreciation to the members of subcommittee and asked each of them to introduce themselves. The members include the following:

- ✧ Dr. Herb Windom, Professor Emeritus at Skidaway Institute of Oceanography. Dr. Windom agreed to chair the subcommittee, representing the BOSC Executive Committee.

- ✧ Dr. James Johnson, Chair of the BOSC, Professor of Civil Engineering and Dean of the College of Engineering, Architecture, and Computer Sciences at Howard University. As an environmental engineer he brings expertise in fate and transport as well as environmental issues in general.

- ✧ Dr. Rogene Henderson, Vice Chair of the BOSC, inhalation toxicologist with the National Environmental Respiratory Center in Albuquerque, NM. Dr. Henderson's expertise includes inhaled materials and toxicokinetics of inhaled materials.

- ✧ Mr. Riu Afonso, President, Energy and Environmental Strategies. Mr. Afonso has worked in the environmental control area for most of his career. He was the head of research and development for a major utility in Massachusetts and has had his own consulting firm for the past 7 years. His experience with mercury is in the area of control technologies and strategic planning.

- ✧ Dr. Cynthia Gilmour, Senior Scientist, Smithsonian Environmental Research Center. She is a biogeochemist with extensive experience in mercury. She works on fate and transport, primarily on microbial production of methylmercury. Dr. Gilmour has served on previous EPA mercury committees, including those working on the most recent *Mercury Research Strategy* and the review of the *Mercury Report to Congress*.

- ✧ Dr. George Lambert, Director, Center of Childhood Neurotoxicology and Exposure Assessment, University of Medicine and Dentistry of New Jersey. He is the Science Advisory Board (SAB) liaison to the BOSC. Dr. Lambert's research has focused on the effects of environmental chemicals on human organ maturation, reproductive function, growth and development, and neurobehavioral function.

- ✧ Dr. Mike Waalkes, Chief, Inorganic Carcinogenesis Section, National Institute of Environmental Health Sciences (NIEHS). He is a metal toxicologist with experience in carcinogenesis and the molecular toxicology of metals. Dr. Waalkes has done research on mercury toxicology in rodents and *in vitro* systems.

Dr. Windom turned the meeting back to Ms. Drumm, who introduced Dr. James Avery, who presented an overview of ORD's multi-year planning process.

Overview of ORD Multi-Year Plans

Dr. James Avery is a member of the Research Coordination Staff in EPA's Office of Science Policy (OSP). He presented an overview of ORD's MYPs, including their purpose, structure, development, and use. (The PowerPoint file of Dr. Avery's presentation was distributed to conference call participants in advance.)

In 2000, ORD initiated a multi-year planning effort to guide the direction of research efforts in selected topic areas. The MYPs provide a framework to integrate research across ORD's laboratories and centers with Government Performance and Results Act goals, which support the Agency's mission to protect human health and the environment. Also in 2000, ORD program managers developed pilots for six MYPs: particulate matter, drinking water, endocrine disrupters, environmental monitoring and assessment, global climate, and pollution prevention. Subsequently, the ORD Executive Council selected 11 additional topics. These MYP topic areas are aligned under the Agency's five strategic goals. The MYPs describe the direction of ORD's research in greater detail than some of the other strategic documents that have been used in the past to provide EPA's strategic direction for research.

The MYPs consist of two major sections, a narrative section and a performance and accountability section. The narrative section provides background information to familiarize the reader with Agency goals and objectives, and includes progress to date from previous versions, an overview of long-term goals (LTGs), the rationale used to sequence the performance measures, and the relationship to other research (e.g., work in other MYPs or by other federal entities). The performance and accountability section provides a logic model, performance measures, and flow diagrams to illustrate how the LTGs will be accomplished.

A major purpose of the MYPs is to serve as a communication and planning tool to address the Agency's priority science. ORD's inclusive process for developing MYPs considers customers' and users' needs (e.g., EPA Program Offices and regions, states, federal research partners, and the private sector); the Agency's strategic plans; ORD's strategic plans; and outside peer advice, including advice from the SAB, BOSC, National Research Council, and scientific peer reviews.

The MYP's lead author coordinates a writing team and serves as the primary point of contact. The writing team consists of laboratory and center experts, program and regional office representatives, OSP staff, and Office of Resource Management Administration staff. The development process assumes level resources using the most recent President's budget. The plans are updated biennially, or as needed, depending on budgetary or scientific changes that might occur.

Dr. Avery provided a diagram outlining the MYP development process. The process begins with the Agency's strategic direction, from which key scientific questions are identified. The writing team evaluates the questions without assuming constraints in resources or scientific capability. The team then considers capabilities beyond ORD, such as research partners in other federal agencies and academia. After getting advice from within EPA and from external sources and stakeholders, the team narrows down areas of potential research to areas in which ORD has an impact and should invest its resources. From there, LTGs are identified, a timeframe is established, and roles for ORD and others are determined. To reach the LTGs, annual performance goals (APGs) are developed and sequenced, and research from all sources is integrated. Annual performance measures (APMs) are established to determine who will accomplish the work and to ensure that the work can be done with the available resources.

In addition to serving as a planning and communication tool, MYPs provide a link between Agency and ORD strategic plans and research strategies and laboratory implementation plans. They are used to develop performance goals and measures, plan the annual budget, and communicate the direction of ORD's research, both internally and externally.

Dr. Avery explained the way in which EPA uses a logic model as a planning tool, beginning with large goals derived from EPA and ORD strategic plans. The next steps include setting outcomes, priorities, sequencing, and a strategic approach. The final step, annual planning, considers EPA priorities and budget guidance, as well as laboratory and center research plans. Dr. Avery presented a logic model that demonstrates how environmental research contributes to long-term outcomes. Resources are used to conduct research that results in outputs (APMs). These outputs are developed for specific clients and for transfer of the research, which leads to short-term outcomes (e.g., client reactions and changes in knowledge, attitudes, skills, or aspirations, as well as changes in client decisions or actions). The short-term outcomes lead to intermediate outcomes, or strategic objectives, that contribute to measurable changes in the environment and ultimately accomplish the LTGs. Dr. Avery emphasized that, although programs are implemented and managed from left to right on the logic model, the planning is done from right to left, beginning with LTGs and working back to resource considerations.

ORD uses the key science questions to develop LTGs. After determining the LTGs, the writing team identifies APGs, which typically are multi-laboratory and multi-center. The APMs measure progress toward achieving APGs and LTGs. The MYPs also include outcomes that can be related to other areas, such as the global climate program or the air program.

MYPs provide critical evidence for the Office of Science and Technology Policy/Office of Management and Budget (OMB) research and development investment criteria. There are three criteria for assessing research programs: relevance, performance, and quality. MYPs also

provide critical evidence for OMB's Program Assessment Rating Tool (PART), a scoring tool that OMB uses to make funding decisions. The rating is based on four sections: (1) program purpose and design, (2) strategic planning, (3) program management, and (4) program results.

Dr. Johnson commented that it is difficult for research projects to demonstrate results prior to completion. Dr. Avery replied that this circumstance is being considered. ORD is trying to look prospectively as well as retrospectively at its research programs and assess the impact both within and beyond EPA.

Dr. Avery's final slides showed that MYPs serve as a basis for ORD's budget request, are used to prioritize work, form the structure for ORD accounting, and serve as a communication tool with EPA and external audiences.

A participant inquired whether ancillary materials should be included with MYPs to enhance communication with regions, states, and Congress. Dr. Avery replied that the development of the MYP includes partners and stakeholders, and MYPs refer to the relevant activities of other agencies. Beginning with EPA's and ORD's strategic goals, the MYP focuses on ORD's niche within a particular science question. The primary users are EPA programs and regions. The secondary users are Congress, states, and others. The MYP also is the primary tool in compiling the congressional justifications.

Dr. Gilmour asked for clarification on the link between the Mercury MYP and the *Mercury Research Strategy*, and mentioned that there were differences in the strategic objectives in each document. She also asked whether the position of National Program Director (NPD) had been filled, and how this will affect the Mercury MYP. Dr. Avery and Mr. William Stelz explained that, in general, the *Mercury Research Strategy* guides the MYP, and the MYP implements the *Mercury Research Strategy*. Mr. Stelz said that he will provide more detail on the relationship between these two document in his presentation. Currently, Mr. Stelz is the acting lead author for the Mercury MYP, but the selection process for the NPD is ongoing.

Dr. Gilmour asked if the MYP applies to both intramural and extramural research. Dr. Avery replied in the affirmative. Dr. Gilmour then asked if the PART accounting system applies to extramural researchers within EPA. Again, the answer was yes. She also asked about the level of EPA Science To Achieve Results (STAR) funding for 2005. Upon hearing that it had not been determined, she commented that it would be important for the reviewers to have the funding information.

Dr. Henderson asked whether MYPs are used for budget requests or whether the budget determines the MYPs. Are MYPs ever used to increase funding? It was explained that MYPs cover several years and assume level resources using the most recent President's budget. MYPs do help to inform budget decisions.

Dr. Waalkes asked about the role of basic researchers. The Research Coordination Teams (RCTs) include Assistant Laboratory Directors who coordinate with the individual principal investigators and provide information to the MYP writing team. Some of the researchers could

be part of the MYP writing team, so there is constant communication between the researchers and the writing team. EPA funds this effort, but the plan also leverages outside resources.

Mercury Multi-Year Plan

Mr. Stelz, from the National Center for Environmental Research (NCER), spoke about the Mercury MYP. In his presentation, he referred to the latest version of ORD's Mercury MYP, dated May 9, 2003, which applies to fiscal year (FY) 2002 through 2010. He also provided PowerPoint slides of his presentation.

As acting lead author of the MYP, Mr. Stelz coordinates ORD's Mercury Research Program with respect to the MYP. He also represents NCER and the STAR program as a member of the Multimedia Research Coordination Team (RCT), and chairs the Multimedia RCT Mercury Research Planning workgroup.

The 2003 Mercury MYP supports Goal 4, Multimedia/Healthy Communities and Ecosystems, of EPA's Strategic Plan. The MYP was based on the *Mercury Research Strategy*, which can be found on the Web at http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=20853. The broad categories of research areas in the plan include risk management for combustion and noncombustion sources; transport, transformation, and fate; human health effects and exposure; ecological effects and exposure; and risk communication. An overview of mercury issues is presented in a poster, which will be displayed at the face-to-face meeting in February.

The 2003 Mercury MYP has two LTGs: (1) to reduce and prevent the release of mercury into the environment, and (2) to understand the transport and fate of mercury from release to the receptor and its effects on the receptor. There are 12 APGs and 68 APMs. The MYP integrates the ORD intramural and extramural research efforts through FY 2010. The resources of the program are approximately $5.5 million and eight full-time employees per year. The 2003 Mercury MYP is available on the Web at www.epa.gov/osp/myp/mercury.pdf.

The research focuses on principal components, including combustion and noncombustion sources, control technologies, environmental fate and behavior, and ecological/biological effects, and cross-component activities, including measuring, modeling, and monitoring.

Mr. Stelz presented a logic diagram that focused on the utilities rule process, emissions, and control strategies and explained that the planning process begins at the right side of the diagram, with long-term outcomes, and works step by step towards the left. The logic diagram then lays out the implementation of the process, working from left to right. Dr. Henderson asked where basic research fits into this kind of a structure. Mr. Stelz explained that the logic diagram is intended to be a broad framework for sequencing the steps in achieving long-term outcomes.

The 2003 Mercury MYP directly or indirectly relates to a number of other MYPs, including those on particulate matter, air toxics, pollution prevention, contaminated sites, water quality, ecosystem protection, human health, and global change. The 2003 Mercury MYP contains tables of the major regulatory activities that take place between 2002 and 2010, including the utilities rule scheduled for release in March 2005. Some of the activities in the MYP relate in part to the

timing of legislation; however, the plan is a living document that is designed to be updated as necessary. The 2003 Mercury MYP also contains charts that depict the relationships between APGs, APMs, and LTGs. It is designed to be a flexible tool for planning research.

The following key science questions, identified by clients, were listed in the plan:

- ✧ How much methylmercury in fish consumed by the U.S. population is contributed by U.S. emissions relative to other sources of mercury (such as natural sources, emissions from sources in other countries, and re-emissions from the global pool)? How much and over what time period will levels of methylmercury in fish in the United States decrease because of reductions in environmental releases from U.S. sources?

- ✧ How much can mercury emissions from coal-fired utility boilers and other combustion systems be reduced with innovative mercury control technologies? What is the relative performance and cost of these new approaches compared with currently available technologies?

- ✧ What is the magnitude of contributions of mercury releases from noncombustion sources? How can the most significant releases be minimized?

- ✧ What are the risks associated with methylmercury exposure to wildlife species and other significant ecological receptors?

- ✧ What critical changes in human health are associated with exposure to environmental sources of methylmercury in the most susceptible human subpopulation? How much methylmercury are humans exposed to, particularly women of child-bearing age and children among highly exposed population groups? What is the magnitude of uncertainty and variability of mercury and methylmercury toxicokinetics in children?

- ✧ What are the most effective means for informing susceptible populations of the health risks posed by mercury and methylmercury contamination of fish and seafood?

The two Mercury MYP LTGs were presented with a selection of APGs and APMs to demonstrate how they are sequenced logically over the course of time. The structure allows for modifying and updating as activities are completed or as emphases change.

ORD's research efforts are coordinated with other EPA program and regional offices, states, and other federal agencies. The mercury activities in the MYP also relate to other national and international efforts, both bilateral and multilateral. For example, the Mercury Roadmap, formerly called the Mercury Action Plan, is an Agency-wide strategy to address multimedia mercury pollution and exposure. Its purpose is to improve internal EPA coordination and provide national leadership on mercury. Of the five priority areas identified for the Mercury Roadmap, ORD and the MYP are involved primarily with one area—conducting mercury research and monitoring.

The following considerations for future research were presented by Mr. Stelz:

- ✧ It is likely that the Mercury Program will not be expanding, but there may be a shift in its focus.

- ✧ How do we strike a balance between combustion, ecological, and health effects research?

- ✧ Further research on the source of methylmercury in top predators in the pelagic marine food chain.

- ✧ EPA has done some exploratory analysis to quantify adult cardiovascular effects associated with methylmercury exposures.

- ✧ Continued research and development of control technology for coal-fired burners and CEMs.

Mr. Stelz summarized his remarks by stating that the 2003 Mercury MYP supports the Agency's goals and serves as: (1) a planning and communication tool, (2) a link between EPA and ORD's Strategic Plan, (3) a basis for budget requests, and (4) a logical sequencing for the ORD research program. The MYP also implements the *Mercury Research Strategy*, improves mercury risk management and assessment, and supports the development of the *Mercury Roadmap*.

To conclude his presentation, Mr. Stelz outlined the subcommittee's next steps. A face-to-face meeting is planned for February 23-24, 2005, during which ORD Mercury Planning Workgroup members will present their research to date in the areas of fate and transport, combustion, and health effects. The workgroup will present recommendations on future research directions, considering possible shifts in focus. In March 2005, the subcommittee will hold another conference call. A final report to be presented to the BOSC Executive Committee is scheduled for May 2005.

Dr. Gilmour commented that EPA's Office of Air and Radiation is interested in developing long-term monitoring programs for mercury, and she asked where that would fit into the MYP. Mr. Stelz replied that monitoring is not a major component of the MYP. Dr. Gilmour asked whether that was because ORD is not in the monitoring business, and the funds would have to come from outside. The short answer was yes, although there are some limited outside funds for monitoring.

Dr. Gilmour asked about the MYP as a basis for funding requests. Considering that there are no dollar amounts, the MYP appears to be a response to the budget rather than providing data for future funding. She and others expressed concern that the $5.5 million funding level is not adequate to accomplish the goals described in the MYP. Mr. Stelz and Dr. Windom explained that because of the level of detail, the MYP is more of an internal EPA planning guide than a basis for congressional funding. The plan also relies on leveraging outside resources. For example, certain APMs may be funded by sources such as the Superfund. The APMs and APGs also are associated with specific laboratories and centers. It was emphasized that the MYP is a flexible, living document, designed to be reviewed and updated as changes occur or activities are completed.

Discussion of the Charge Questions and Writing Assignments

Dr. Windom provided brief guidance for addressing the charge questions. He suggested that members include a balance of strengths and weaknesses and aim for a succinct report. Each participant will be assigned certain questions, but ultimately everyone will have a chance to address all of the questions. Dr. Windom will assign members to particular questions on the basis of the preferences they stated during the call. Members assigned to the same questions should work together on their draft responses by e-mail so that at the February meeting, the subcommittee can reach consensus on all of the questions and develop a draft report.

Ms. Drumm reminded the group that FACA guidelines prohibit closed meetings of more than half of the subcommittee members. She noted that materials may be circulated among the individuals working on one of the charge questions. Members should copy Ms. Drumm on any correspondence and contact her for any additional materials. Anyone needing clarification should send their questions to Dr. Windom and Ms. Drumm 2 weeks before the meeting. She will use these in finalizing the agenda.

Logistics for the February Meeting

The next meeting will be held on February 23-24, 2005, in Arlington, VA, at the Holiday Inn Rosslyn at Key Bridge. Ms. Drumm will send an e-mail with the logistical information, a travel voucher, flight information, etc. Room reservations must be made by Friday, January 28, to secure the government rate.

Ms. Drumm suggested a meet-and-greet breakfast at 7:30 a.m. on February 23. The meeting will start at 9:00 a.m. and continue all day. EPA staff will make presentations in the morning. Time will be set aside for subgroups to meet and discuss their charge questions. Later, the entire subcommittee will meet to discuss all of the charge questions. There will be time set aside for public comments before lunch on February 23.

The subgroups will present responses to their assigned charge questions in the late morning or early afternoon on February 23 so that there will be time later that day to revise them and incorporate points from the group discussion. The goal is to have the reports in good shape for the next morning. The plan is to develop the letter report as much as possible on February 24 so that it can be finalized during the March 29 conference call.

Dr. Windom will contact everyone by e-mail to finalize the details about scheduling and assignments. He would like to have each subgroup's response prior to the February meeting. He will bring a laptop equipped with PowerPoint, and Ms. Drumm will arrange for an LCD projector and projection screen. Ms. Drumm asked the subcommittee members to track the hours that they spend working on subcommittee tasks outside of the conference calls and meetings. Subcommittee members should contact her if they have any questions.

Dr. Windom adjourned the conference call at 11:45 a.m.

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